Vertical Sorting of Fish by Size Using Vertical and Horizontal Bar Racks

Investigators

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Summary

We (Fisheries and Wildlife Resources Group and Hydraulic Investigations and Laboratory Services Group) have been developing and testing vertical wall fish separator systems with the objective to pass smaller more vulnerable fish to one holding system while diverting the larger more predaceous fish to another. The goal is to reduce fish losses to predation within the Tracy Fish Collection Facility (TFCF). Louver walls were first designed and used at the TFCF because of fairly high amounts of vegetative debris (peat fibers) in the system (Bates *et al*. 1960). Louver systems work by intercepting and diverting fish into bypass intakes while passing water to some diversion/intake canal.

To date, we have tested traditional louvers (uniform sweeping flows assisted by guide vanes) in a laboratory flume, and then varied slat angle, slat spacing, wall angle, and removed guide vanes. Our purposes were to first determine if the laboratory model performed like the secondary louver wall at the TFCF, and secondly to modify the model to separate fish by size. These studies found that efficiencies in the laboratory flume were similar to field efficiencies, and that a louver wall angled 30 or 45 degrees with slats angled 15 or 90 degrees and spaced 2 inches (a "leaky louver") was most effective at vertically sorting fish (Karp and Kubitschek 2000). More recently, we completed testing a vertical bar rack with bars oriented horizontally and vertically with the intention to leak smaller fish to one holding area and divert larger fish to another**.**

Problem Statement

Design a screen that can be used at the TFCF to help separate smaller (<100 mm TL) more vulnerable fish from larger fish in the debris-laden **s**outh Delta water.

Dissemination of Results (Deliverables and Outcomes)

We will provide a final report in FY 2011 to be published as a technical bulletin or Tracy volume.

Literature Cited

Bates, D.W., O. Logan, and E.A. Pesonen. 1960. *Efficiency evaluation, Tracy Fish Collection Facility, Central Valley Project, California*. Bureau of Reclamation, Sacramento, California.

Karp, C.A. and J. Kubitschek. 2000. Tracy Experimental Laboratory Facility investigations: leaky – louver development preliminary results. Bureau of Reclamation, Denver, Colorado.